1897.

ANNUAL REPORT

OF THE

Medical Officer of Health

FOR THE

BOROUGH OF MAIDSTONE.

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1898.

Borough of Maidstone.

REPORT OF THE MEDICAL OFFICER OF HEALTH,

FOR THE YEAR 1897.

TO THE URBAN DISTRICT COUNCIL.

MR. MAYOR AND GENTLEMEN,

The Census upon which the calculations relating to the vital statistics are based is now six years old, so that a considerable allowance has to be made in the estimation of what was the probable population of the Borough at the middle of the year 1897. Assuming that the rate of increase since 1891 was equal to what it had been between 1881-91, the respective populations for the two divisions of Maidstone were as follows:—

East Maidstone	17,293
West Maidstone.....	16,538
	33,831

Upon these figures are based all the calculations that follow:—

From out of this population there were registered

Of Births	765
„ Deaths.....	606
„ Persons married	478

So that the rates per annum per thousand were:—

Of Births	22·60
„ Deaths	17·90
„ Marriages.....	14·12

BIRTHS.—In EAST MAIDSTONE the births numbered 425 = 24·57 per thousand; in WEST MAIDSTONE 340 = 20·56 per thousand; 3·53 % of those in East, and 3·53 % of those in West, were illegitimate, against a mean for Kent of 3·9 and for England and Wales of 4·2.

This is by a long way the lowest Birth rate of which I have any record for Maidstone, the average rates for the two decades 1870-79 and 1880-89 were as follows:—

	1870-79.	1880-89.
East.....	35·24	33·93
West	29·59	28·14
Whole Borough..	32·50	31·17

DEATHS.—In EAST MAIDSTONE there were 287 deaths, = 16·59 per thousand, and in WEST MAIDSTONE 319, = 19·29 per thousand; the mean for England and Wales for the same time being 17·4.

After compensation for *Age and Sex Constitution*,* our COMPARATIVE MEAN DEATH RATE amounts to 19·58, and our COMPARATIVE MORTALITY FIGURE = 1125, that is to say the loss by death of an equal number of persons, in all respects comparable as to age and sex, was 1,125 in Maidstone, as against 1,000 in England and Wales. I need hardly say this unfavourable position was chiefly due to the Typhoid Epidemic.

* Got by multiplying by the factor 1·094; for an explanation of this correction see Annual Report for 1893, pages 5-9.

The Average Age at time of Death.

1897.	East.	West.	Whole Borough.
1st Quarter	33·41	33·66	33·53
2nd ,, ...	33·48	38·54	36·09
3rd ,, ...	26·28	25·19	25·71
4th ,, ...	36·79	27·95	31·74
Whole Year	32·19	29·88	30·97
Average for past 19 years.	32·92	33 32	33·04

The mean age at death was unusually low, lower than it has been since 1889; 2·07 years below the mean for the previous 19 years. The principal causes for this were deaths from Diarrhœa and Diphtheria in children under five, and a general increase, chiefly from Typhoid, between the years 5 and 55. Table II gives the usual information in detail as regards *Age*, and Table III as regards *Cause*—as distributed among ten various classes of disease. The deaths from the seven chief *Zymotics* were 5·52, against an average of 1·68, and from other *Zymotics* ·94, against an average of ·328. There is nothing calling for special notice under either of the other heads.

The Infant Mortality, that is to say deaths per 1,000 of Births under one year (as shown by the Table on page 4), was somewhat higher than we have recently found it; but on the whole, considering the troubles we have passed through, it is not altogether unsatisfactory.

Small Pox.—We have had no case, fortunately. As a matter of duty I am bound to remind you that owing to the neglect of vaccination in recent years, it is only a matter of chance that we have escaped so far; unless strenuous efforts are made, under the promised new vaccination laws, to make good the accumulated neglect, we have reason to dread a

terrible explosion of Small Pox as an inevitable consequence.

Deaths per 1,000 Births of Children under one year in Maidstone.

Year.	1st. Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Whole Year.
1870	165	97	263	115	160
1871	258	107	278	117	190
1872	181	116	171	144	153
1873	136	118	246	127	157
1874	182	93	261	119	164
1875	187	106	157	165	154
1876	147	112	141	98	124
1877	211	140	187	84	155
1878	161	176	209	155	175
1879	135	145	122	165	142
Average	176·3	121·0	203·5	128·9	157·4
1880	135	120	229	118	153
1881	120	119	122	64	106
1882	138	110	100	151	125
1883	218	79	122	139	138
1884	189	78	159	125	138
1885	140	75	187	139	133
1886	118	105	191	166	142
1887	80	59	158	114	103
1888	167	136	167	145	154
1889	132	99	173	137	135
Average	143·7	98·0	160·8	129·8	132·7
1890	136	117	93	113	115
1891	140	113	150	157	140
1892	128	87	110	80	102
1893	64	90	222	80	111
1894	167	119	112	116	128
1895	133	62	172	157	129
1896	156	82	129	162	133
1897	143	80	219	100	138

MEASLES.—Owing to the extensive prevalence of Measles during 1896, the Borough had been pretty well swept clear of persons susceptible of this disorder, so that very few cases occurred during 1897, causing one death only, against an average of 9·2.

SCARLET FEVER was notified in 29 instances, resulting in one death only; 18 cases, with one death, occurred

in West Maidstone, and 11 in East. The average notifications have been 99·2, so that the disorder was less than a third as frequent as has been usually the case. What little there was of Scarlet Fever was of a very mild description, and not confined to any one locality, in three instances only were there multiple cases in one and the same house.

DIPHTHERIA.—Of this disorder there were 211 cases, and three others of Membranous Croup, making 214 altogether, 95 being males and 119 females; 97 were in East Maidstone and 117 in West. This is a larger number than has been recorded in any one previous year. The mortality was 48, 22 being male and 26 female—21 in East Maidstone and 27 in West—making a mortality case rate = 22·75 %. The cases were distributed pretty equally both as to time and locality, and the disease must be regarded as having been epidemic from the middle of November, 1896, right through the year 1897. The first case appears to have been a little boy living in the Loose Road, attending All Saints' School; his was an unrecognized case, he infected his younger sister, who was also a pupil at the Infants' department of the All Saints' Schools; she died on November 9th, 1896, and from her the disease spread right through November and December 1896, January, February, March and April, 1897. At the Easter holidays and for a short time after there was a pause, but on the second of July it recommenced in the same School and continued through July, August, and September until hopping; all this was in spite of the closest possible watching, segregation of the affected children, and prohibition from attendance at School of all members of the sick

families, and the repeated closing of the infected Schools in April, July, and August, each closing being followed up by processes of cleansing and disinfection of the most thorough description.

In connection with All Saints' Schools there were 37 primary cases and 26 secondary, that is to say 37 families originally infected at this School, and 26 secondary cases in those families. Of other centres of infection there were the British Schools (8 cases) a group of insanitary dwellings in Scrubs Lane (12 cases) and the West Kent General Hospital (7 cases). It is clear that infection through School attendance was a main cause of the spread, but it is not clear whether it was through the *School premises*, or the *pupils* attending the School, that the infection came. Probably an important element in the epidemic prevalence was the sudden rise that took place in the ground water during August, past experience having repeatedly demonstrated a connection between these two things. The general distribution as to age and district is shown in the following table:—

	Cases.	Sex.		Deaths.	Sex.	
		M.	F.		M.	F.
East	Under 5 yrs.	15	18	Under 5 yrs.	4	5
	5 yrs. and upwards	35	34	5 yrs. and upwards	6	6
West	Under 5 yrs.	13	14	Under 5 yrs.	6	9
	5 yrs. and upwards	31	51	5 yrs. and upwards	6	6
Whole Borough	Under 5 yrs.	28	32	Under 5 yrs.	10	14
	5 yrs. and upwards	66	85	5 yrs. and upwards	12	12
Total ..	All ages	94	117	Total	22	26

Whooping Cough was fatal in 8 instances, 4 in each district, our average for the 19 years past being

10·36. As a rule the average is exceeded about every third year; 1894 was the last year of excess, so that it is to be expected Maidstone will not escape much longer.

Typhoid Fever.—The notifications of Typhoid Fever during the year 1897 were 1888 in number. 859 were referred to East Maidstone, 1,029 to West Maidstone. There was dual notification in some instances, but the above figures give the actual number of cases. The total deaths were 130, producing a case mortality = 6·88 %. 51 of the deaths relate to East Maidstone, = 5·93 %; 79 to West Maidstone, = 7·68 %.

This terrible visitation began during the second week in September; up till then Maidstone had been unusually free from this disease. The following table will give an idea as to the progress of the disorder, and the explosive violence with which it commenced:—

Dates.	Notifications.		Deaths.	
	East.	West.	East.	West.
Week ending September 11.....	2	—	—	—
,, ,, 18.....	58	64	—	—
,, ,, 25.....	285	378	6	7
,, October 2.....	249	242	10	20
,, ,, 9.....	100	161	9	19
,, ,, 16.....	46	66	8	12
,, ,, 23.....	25	36	5	7
,, ,, 30.....	23	22	6	5
,, November 6.....	23	12	2	2
,, ,, 13.....	12	13	3	—
,, ,, 20.....	12	11	1	5
,, ,, 27.....	8	8	1	1
,, December 4.....	4	6	—	—
,, ,, 11.....	2	2	—	1
,, ,, 18.....	3	5	—	—
,, ,, 25.....	1	1	—	—
,, (1898) January 1.....	1	1	—	—
Totals	854	1028	51	79

By the end of the year, as this table shows, the Epidemic had nearly but not quite spent itself.

DIARRHŒA.—The number of deaths attributed to this cause was 29, and of these 25 = 0·74 per thousand of population, which is about double our usual rate, occurred at the time of the year when Summer Diarrhœa is liable to prevail, as the following table shows:—

DATE.	East.	West.	Whole Boro'.
Week ending July 31.....	—	1	1
,, August 7.....	2	—	2
,, ,, 14.....	5	2	7
,, ,, 21.....	2	2	4
,, ,, 28.....	2	4	6
,, September 4.....	2	—	2
,, ,, 11.....	2	1	3
,, ,, 18.....	—	—	—
Total 8 weeks.....	15	10	25

Comparing this table with the one preceding, it is seen that the Diarrhœa deaths just preceded those caused by Typhoid. There can be no doubt but that the two sets of fatalities were intimately connected—a point that will be fully gone into when the report upon the Typhoid Epidemic is written. At the present it must suffice to say that it is my opinion that of these deaths ascribed to Diarrhœa many of them arose from a cause quite distinct from the cause that usually produces Summer Diarrhœa.

PHTHISIS caused 35 deaths, = 1·03 per thousand of population, which is below the mean (1·26) from this disease for the last 19 years.

The mortality from other classes of disorder is given in extenso in Table III, the substance of which for convenience of ready reference and comparison is summarised in a concise form, as follows:—

Causes of Death.—Rate per 1,000.

Disease.	East Maidstone.		West Maidstone.		Whole Borough.	
	1897.	average 19 years	1897.	average 19 years	1897.	average 19 years
Seven Zymotic Diseases	4·33	1·99	6·77	1·394	5·52	1·805
Other Zymotics.....	1·15	·376	·72	·278	·94	·326
Phthisis	·63	1·349	1·45	1·179	1·03	1·266
Other Constitutional Diseases..	1·27	1·531	1·03	1·221	1·15	1·487
Disease of the Respiratory Organs	2·14	3·503	2·23	2·524	2·18	3·015
Diseases of the Organs of Circulation	1·67	1·389	1·21	1·099	1·44	1·318
Other Local Diseases	2·66	3·353	3·36	2·900	2·95	3·148
Developmental Diseases	1·56	2·120	1·15	1·728	1·36	1·930
Deaths by Violence	·46	·542	1·03	·595	·74	·561
Causes ill-defined or not specified	·69	·462	·42	·811	·56	·922

With exception of the large excess under the head of Zymotics, these figures are all quite satisfactory, and if we subtract the Typhoid deaths, which must be regarded in the light of a huge accidental misfortune, the deaths from the seven Zymotic Diseases is reduced to 1·68 per thousand, which is well below the corresponding figure (2·15) for all England and Wales, as is exhibited in the following Comparative Table:—

Locality.	All causes.	Seven Zymotics.	Small Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.
East Maidstone..	16·59	4·33	..	..	..	1·15	·23	2·95	·98
West ,, ..	19·29	6·77	..	·06	·06	1·51	·24	4·77	·72
Whole Boro'	17·90	5·82	..	·03	·03	1·33	·23	3·84	·85
England and Wales	17 4	2·15	·00	·40	·14	·24	·35	·16	·86
33 Great Towns ..	19·1	2·87	·00	·55	·18	·31	·41	·18	1·24
67 Large Towns ..	17·2	2·41	·00	·43	·15	·24	·38	·16	1·05
England and Wales Rural	16·4	1·62	·00	·29	·12	·19	·31	·14	·57

THE NOTIFICATION ACT.—The following is a summary of all the Notifications received during the year, and also the six previous years, the space during which the Act has been in force in Maidstone:—

DISEASE.	1897.	7 Years Average.
Diphtheria	208	101
Croup	3	3
Scarlet Fever	29	89
Typhoid Fever	1888	289
Continued Fever	..	
Erysipelas	13	28
Puerperal Fever	4	4
Small Pox	—	4

DIPHTHERIA AND CROUP.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	12	36	16	28	18	10	44	23
2nd	3	27	53	14	8	7	50	23
3rd	5	15	48	17	16	9	83	28
4th	13	28	46	13	30	27	34	27
Year	33	106	163	72	72	53	211	101

SCARLET FEVER.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	7	..	30	37	19	8	14	16
2nd	4	4	90	18	9	14	9	21
3rd	4	15	79	27	13	11	4	22
4th	5	25	107	17	29	23	2	30
Year	20	44	306	99	70	56	29	89

TYPHOID AND CONTINUED FEVER.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	4	2	4	5	5	4	4	4
2nd	2	3	10	3	5	3	..	4
3rd.....	2	3	11	2	5	3	1280	187
4th.....	9	8	9	2	6	6	604	94
Year.	17	16	34	12	21	16	1888	289

ERYSIPELAS.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average
1st	8	12	14	13	2	5	2	7
2nd	5	6	13	5	2	3	2	5
4th.....	8	7	15	4	7	5	2	7
5th.....	4	12	18	9	6	6	7	9
Year	25	37	60	31	17	19	13	28

PUERPERAL FEVER.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	1	3	2	3	1	3	3	2·0
2nd	..	1	2	2	..	..	..	·7
3rd.....	1	..	3	..	..	..	1	·7
4th.....	..	..	2	..	1	..	..	·4
Year	2	4	9	5	2	3	4	4·0

SMALL POX.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	1	..	1	20	..	..	..	3·0
2nd	..	..	..	4	..	..	..	·5
3rd.....	..	..	..	4	..	..	..	·5
4th.....	..	..	1	1	..	..	..	·3
Year	1	..	2	29	..	..	..	4·0

TOTAL NOTIFIABLE ZYMOTICS.

Quarter.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Average.
1st	33	53	66	106	45	30	67	55
2nd	14	41	168	46	24	27	61	54
3rd.....	20	40	156	54	41	28	1370	245
4th.....	31	73	183	42	72	63	647	153
Year	98	207	573	248	182	148	2145	456

So that Notifiable Disease was far above the average of past experience, in the proportion of 2,145 against a former average of 242·6. The excess is due to Typhoid and Diphtheria. When the excess from these two causes is subtracted, the Notifications from other causes are 94 fewer than the average.

PUBLIC HOSPITAL.—Leaving cases of Typhoid out of the computation, for these must be dealt with in a separate report, the total of admissions to the Public Hospital was 139, and comprised the following cases:—

Scarlet Fever	17
Diphtheria	122
	139

23 of the 139 ended fatally, giving a case mortality = 16·5 %.

The cost of maintenance of Staff and Patients, on account of these 139 cases, is given in Table on page 13.

DISINFECTION STATION.—Houses disinfected 165, and two Schools. 4,378 articles of clothing or furniture were removed from infected houses, disinfected, and returned to their respective owners free of charge.

1897.	Staff.				Patients.			
Month.	No. of Days.	Cost. £	s.	d.	No. of Days.	Cost. £	s.	d.
January	155	9	2	4·6	306	15	15	3·3
February	140	8	4	8·8	298	14	16	6·5
March	155	9	2	4·6	322	16	4	2·4
April	150	8	16	6	382	18	6	7·5
May	155	9	2	4·6	306	14	14	2·3
June	150	8	16	6	374	17	9	7·5
July	155	9	2	4·6	361	18	0	10·0
August	155	9	2	4·6	310	15	15	4·8
September	150	8	16	6	302	15	3	5·6
October	155	9	2	4·6	166	7	19	8·3
November	150	8	16	6	54	2	6	11·4
December	155	9	2	4·6	102	6	16	1·3
Total	1825	£107	7	5	3283	£163	8	10·9

METEOROLOGY.

Temperature and Rainfall.

Rainfall.—The Rainfall for Maidstone for the year 1897 was 19·73 inches, this is 4·06 inches short of the 10 years (1880-89) average, and no less than 7·66 of the average (1870-79), in fact it is the shortest rainfall recorded since the year 1870, when 19·56 inches were registered; moreover it was most anomalous as regards its distribution, for March was an unprecedently wet month. July, October, and November were exceptionally dry. In March there was 1·93 and in August 0·5 an inch excess; in July 1·73, October 3·4, and November 1·52 too little rain. The heaviest falls of the year took place during the 8th and 12th weeks. During the three successive weeks, 27th, 28th, and 29th, and the five successive weeks, 40th to 44th (except for $\frac{1}{50}$ of inch in the 41st) no rain whatever fell.

Temperature.—The year as a whole was warm, and so was each quarter, the only real cold was

during the 2nd and 3rd weeks, when the thermometer fell 7·3°, and 6·1° below the mean for that time of year; during the 50th and 52nd weeks the thermometer stood 6·2°, and 6·6° above the average for the time of year, and at the beginning of August, during the 31st week, it stood at 5·8° above the mean.

The Winds.—The following table exhibits the departures from the average in excess or deficiency, as compared with former years, in days:—

Year.	NW	N	NE	E	SE	S	SW	W
1897	−4	−14½	+17½	+6½	+2¾	+2	−26	+15¾

The greatest deviation from the average is there shown to be in favour of N.E., W., and E.; the greatest deficiency was from S.W. and N.

Humidity.—As might be expected from the short rain-fall, the atmosphere was more dry than usual, as the table shows, sometimes remarkably so, for instance during May and July there was 10%, and in October 7% less moisture in the air than usual for the same time of year.

Month.	Mean for 1897.	Mean for 56 years.	Difference for 1897.
January	89	87	+ 2
February	86	84	+ 2
March	79	81	− 2
April	77	79	− 2
May	68	78	−10
June	75	74	+ 1
July	65	75	−10
August	72	77	− 5
September	80	81	− 1
October	82	89	− 7
November	87	91	− 4
December	86	89	− 3
Mean	78·8	82·1	− 3·3

SUBSOIL WATER.—The mean height of the Subsoil Water at my Laboratory was 194·66 below the level of the ground, the mean for the preceding 12 years being 197·15, so that the water stood 2·49 inches higher than the average, but 0·85 of an inch lower than during 1896. It reached its greatest height, 177·96 inches during the 6th week, and its lowest point, 208·92, during the 46th, 47th, and 48th weeks, giving a range of movement equal to 30·96 inches. During the 32nd, 33rd and again during the 35th and 36th weeks two very remarkable and sudden up-risings took place, separated by an interval during which it fell. These occurrences, as will be shown when the Typhoid report is written, were the proximate cause of the terrible Epidemic that followed.

Subsoil Water Levels.

Year.	Average for Year.	Highest.	Lowest.	Range.
1885	201·52	187·92	212·40	24·48
1886	202·81	188·64	211·68	23·04
1887	200·07	186·72	208·56	21·84
1888	198·50	189·84	203·28	13·44
1889	198·18	193·68	204·00	10·32
1890	199·23	192·24	206·52	14·28
1891	196·18	188·28	201·60	13·32
1892	195·76	182·16	204·00	21·84
1893	193·96	181·20	203·76	22·56
1894	193·89	176·88	198·96	22·08
1895	194·06	186·00	201·24	15·24
1896	193·81	179·40	203·88	24·48
1897	194·66	177·96	208·92	30·96

In inches beneath the surface at the Laboratory.

GENERAL SANITARY CONDITION AND PROGRESS.

From Mr. Bunting, the Borough Surveyor, I learn that the following works of sanitary interest have been carried out during the year:—

"Eighty-two new houses have been erected. 40 houses and buildings have undergone alteration or have been added to. 19 new buildings of the warehouse and public buildings class erected. 3 stables, 1 bakehouse, and 1 cowshed have been erected. 122 connections have been made with the public sewers.

"The number of new houses erected is 38 less than the previous year, the chief reason being the increased price of building materials, which has to some extent checked speculating building operations. The number of connections with the public sewers shows an increase of 24 on the preceding year; this is accounted for by the drainage work in connection with existing buildings in the Borough, in addition to new buildings.

"Four sewer ventilating shafts have been erected during the year, and four manholes constructed on the sewers in different parts of the town. Very little has been done in the work of constructing new streets during the year, and the same remark applies to new sewers. The only instance in either case being Evelyn Road, the total length of which is 253 feet."

The work of the Sanitary Inspector, Mr. Jackling, is set forth in the list of various "HOUSES AND OTHER PREMISES DEALT WITH BY NOTICE OR OTHERWISE." (See page 17.)

PUBLIC WATER SUPPLY.—The results of the quarterly analyses of the waters derived from the four Public Supplies for the three first quarters of the year are given in Table IV., that is to say on samples collected on January 7th, April 2nd, and June 25th; the results on each occasion were satisfactory. Before the time for the fourth set of analyses came due, as unfortunately is only too well known, the Epidemic of Typhoid had

overtaken us, consequently it became necessary to make many analyses of all the Public Waters, especially of those composing the Farleigh branch of the Water Company's Supply, the results of which have been fully recorded in a Special Report rendered last December; it will therefore not be necessary to dilate upon those analyses here, but their further consideration will be taken up again when the Special Report upon the Typhoid Epidemic is written.

List of Houses, &c., dealt with by Notice or otherwise.

Houses without drains, or re-constructed	156
Drains repaired and cleansed	340
Water Closets ditto	250
Houses provided with new Water Closets	20
Houses provided with additional Water Closets	2
Old Pan Closets with Container D Traps removed	24
Water Closets provided with Water Supply and Flushing Apparatus	284
Soil Pipes removed outside dwellings, and ventilated	12
Slop Sink and other Waste Pipes disconnected from Drains	48
Trapped Stoneware Gullies provided, in lieu of Defective Brick and Bell Traps	180
Houses provided with Ash-pits or Dust-bins	91
Houses provided with shooting, or repaired	20
Cesspools cleansed, or filled up	8
House Refuse removed on complaint	14
New Privies constructed	2
Construct or Repair Urinals	8
Remove Water in Cellars	2
Remove Pigs	14
Overcrowding	6
Houses cleansed and lime-washed	5
Remove Manure	15
Remove Pigeons, Poultry, and Animals	18
Houses supplied with Company's Water	
House Roofs repaired	21
Back Yards of Dwelling Houses provided with new Concrete Pavement	96
Manure Pits constructed	7
Old Drains Trapped from Sewer, and ventilated	6
Miscellaneous, not under above heads	80
New Glazed Stoneware Pipe Drainage laid (4,625 feet)	
Total	1729

Of Water from Private Wells nine samples have been submitted for analysis, and the results of the analyses were as follows:—

1897.	Number.	Description.	Total Solids.	Loss on Ignition.	Chlorine.	Nitrogen as Nitrates.	Ammonia.		Oxygen absd. in		Hardness.		Appearance in 2-foot tube.
							Free.	Alb.	¼ hr.	4 hrs.	Total.	Perm.	
Feb. 26	1	Pheasant Cottage, Wheatsheaf.	29·7	2·0	1·8	·57	·01	·02	·006	·013	18·4	7·5	p. cl. gr.
,, 26	2	Constable's, Loose Road.	31·3	0·6	2·0	·57	·00	·01	·007	·012	18·6	8·4	cl. bl. gr.
Mar. 17	3	38, High Street	89·1	5.5	6·8	·87	3·30	·29	·027	·075	28·5	16·3	cl. gr.
Apl. 22	4	Fant House.....	42·2	3·8	2·9	·81	·04	·05	·003	·020	21·0	9 6	opq. bwn.
May 28	5	Rocky Hill Allotm't Cottage in.	32·3	2·3	2·3	·57	·28	·15	·011	·017	17·2	8·6	dirty gr.
June 17	6	Abbey Gate Farm...	37·9	2·3	2·5	·57	·09	—	·007	·020	18·2	8·3	p. gr., sl. sed.
Sept. 16	7	73, King Street	84·1	6·4	6·4	1·96	—	·05	·005	·026	19·6	18·5	gr. bl. sed.
,, 17	8	7-10, Orchard Street	53·6	3·4	3·4	1·14	—	·05	·003	·018	23·1	15·6	gr. bl. rather dty
,, 17	9	140-146, Union St....	61·2	3·8	3·8	2·28	—	·02	·007	·026	23·0	13·7	gr. dirty

The opinion expressed and advice given in respect to the above analyses were as follows:—

Nos. 1 and 2—"No evidence of serious pollution in either."

No. 3—"Very greatly polluted, and totally unfit for drinking purposes."

No. 4—"Comes through polluted soil, and cannot be relied upon as being wholesome for drinking purposes."

No. 5—"Not a safe water to use for drinking purposes."

No. 6—"Not much to find fault with."

Nos. 7, 8, 9—"These are all polluted, and should never be used for dietetic purposes without previous boiling."

The action taken in regard of all, excepting No. 8, was simply to warn the owners and request them to close the Wells, with the result that Nos. 3, 4, 5, 7, and 9, were closed.

In respect to No. 8 a prosecution was ordered. Particulars relating to this care are to be found in an appendix.

Apropos of this subject it will interest you to know that elaborate and convincing experiments have recently been made by various observers* on the behaviour of the organism of typhoid when implanted in the soil, they find that it will grow and multiply indefinitely and in so doing spread slowly from the centre of its implantation, and so become indigenous, and invade the neighbouring soil, especially that which is polluted with ordinary organic matter, so that it is now an established fact that the live micro-organism of typhoid, unlike ordinary dead organic matter is not destroyed by the organisms of the soil that produce nitrates, indeed experimental evidence points the other way, for it appears that the typhoid organism flourishes upon the nitrates produced by the nitrifying organisms, so when there is an abundance of nitrates the chance for a survival of the typhoid bacillus is all the greater. These discoveries make the arguments for the old fashioned standards of Mr. Wanklyn and his followers no longer tenable, their contentions that the presence of nitrates in water is of no sanitary importance because they only tell of organic matters that have already undergone natural chemical destruction and therefore been rendered inert, their presence being actual evidence that the process of natural purification has been accomplished, is altogether misleading; these doctrines are based upon an imperfect view of the case, they assume that nitrification affects all organic matter, living and dead alike, whereas we now know that the process is limited in its action to dead organic matter. Animal excreta which constitute the source

* See Annual Report of Local Government Board, 1896-97, Supplement containing Report of the Medical Officer, 1896-7, page 231 (Dr. Sidney Martin). See British Medical Journal, No. 1,932, January 8th, 1898, page 69 (Dr. Robertson and Dr. Gibson).

of the poisons whence such diseases as typhoid and cholera are derived, are composed of organic matters under the two conditions, that which is *dead* comprising by far the larger portion, *is subject* to nitrification; the other, *the living*, infinitely small in quantity but infinitely large in activity *is not subject* to nitrification, it is this living portions that contains the germs of disease. So that it comes to this, excess of nitrates in drinking water is direct evidence of the pollution by some kind of organic matter, and when collateral evidence of another sort gives ground for suspicion that the source whence the water is derived is exposed to pollution by organisms of a disease-giving kind common sense tells us such water cannot be used for drinking purposes without danger.

Food and Drugs Act.—45 samples have been submitted for analysis under the terms of this Act, 5 of these were of Spirits and 40 of Milk. All the Spirits passed; 5 of the milks were more or less adulterated—in one instance with $23\frac{1}{2}$ % of added water—two others having had portions of the cream removed to the extent of 21 and 20 per cent. respectively, calculated upon a standard of milk of an ordinary quality, in two other cases water had been added, but in quantity too small to justify certificates for prosecution. (See page 21.)

Housing of Working Classes Act.—Nothing has been done under the provisions of this Act.

Dairies, Cowsheds, and Milkshops Order, 1885. I have instituted a complete and thorough inspection of all the Cowsheds, Dairies and Milkshops; steps are being taken to keep all places where milk is produced, stored, or sold, in proper sanitary condition.

Article.	Result of Analysis.
Milk	Pure.
Milk	,,
Milk	,,
Whiskey	,,
Whiskey	,,
Whiskey	,,
Whiskey	,,
Milk	,,
Milk	20 per cent. cream removed.
Milk	Pure.
Milk	$23\frac{1}{2}$ per cent. added water.
Milk	21 per cent. cream removed.
Milk	Pure.
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	Small amount added water.
Milk	Pure.
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	,,
Milk	Low quality, but pure.
Milk	Pure.
Milk	,,
Total 45.	= 8·88 per cent. adulteration.

Factory and Workshops Act.—The usual inspections have been made, but nothing of sanitary importance has been reported.

Canal Boats Act.—The same remarks apply to the work under this Act.

Bakehouse Regulation Act.—The whole of the Bakehouses have been kept under regular inspection; their cubical capacity measure; cleansing and lime-washing enforced.

Notwithstanding the disturbing effect of the epidemic the ordinary work of sanitation has been kept well in hand, and there is every reason for hoping that in some important particulars, good may come out of the evil.

I have the honor to be,
Mr. Mayor and Gentlemen,
Your obedient servant,
MATTHEW A. ADAMS,
Medical Officer of Health.

Trinity House, Maidstone,
April, 1898.

BOROUGH OF MAIDSTONE, 1897.

TABLE I.

AREA. The area is 4,008 acres, divided into two divisions, East and West, by Week Street, Gabriel's Hill, and Stone Street; all to the West, including the Western sides of those Streets, constituting West Maidstone; the East Side, East Maidstone.

THE AREA OF { East Maidstone ..... 2,019 acres.
West ,, ... 1,989 ,,

ELEVATION. The population reside at a mean Elevation of 70 feet above the sea level, ranging from 20 to 120.

HOUSES. At the census of 1891 there were { West 2,693 / East 3,314 } =6007 inhabited houses, containing on an average { West 5·8 / East 5·8 } =Whole Borough 5·37 persons to a house.

ANNUAL RATEABLE VALUE of Property in the Borough for the Poor Rate is £151,754.

DENSITY (1897) { East..... 8·56 persons per acre.
West ..... 8·31 ,, ,,

POPULATION, estimated to the middle of 1897 } Total 33,831 { East Maidstone..... 17,293.
West ,, ... 16,538.

				Legitimate.	Illegitimate.
BIRTHS. Males.... 393 / Females.. 372	Total 765	East Maidstone	425	410	15
		West ,, ...	340	328	12

ANNUAL RATE OF BIRTHS PER 1,000....East Maidstone 24·57....West Maidstone 20·56....Whole Borough 22·60.

DEATHS. Males.... 295 / Females.. 311	Total 606	East Maidstone .... 287 / West ,, ... 319	Whole Borough..606.

ANNUAL RATE OF MORTALITY PER 1,000 .. East Maidstone 16·59 .. West Maidstone 19·29 .. Whole Borough 17·90.

EXCESS OF BIRTHS OVER DEATHS, East Maidstone 138, West Maidstone 21, Whole Borough 159.

TABLE II.

Deaths at different ages, at rate per 10,000 per annum.

Period.	District.	Under 1 year.	1 to 5 years	5 ,, 15 ,,	15 ,, 25 ,,	25 ,, 35 ,,	35 ,, 45 ,,	45 ,, 55 ,,	55 ,, 65 ,,	65 ,, 75 ,,	75 ,, 85 ,,	85 and above.	Total.
1st Quarter..	E	39·3	23·1	9·2	2·3	4·6	4·6	6·9	13·8	27·7	11·5	4·6	148·0
,, ..	W	26·6	14·5	12·1	14·5	4·8	2·4	9·6	14·5	7·2	19·3	4·8	130·6
2nd Quarter..	E	20·8	18·5	11·5	2·3	4·6	11·5	16·1	13·8	6·9	11·5	2·3	120·2
,, ..	W	12·1	9·6	16·9	14·5	7·2	9·6	19·3	12·1	9·6	19·3	2·4	133·0
3rd Quarter..	E	48·3	27·7	32·3	16·1	11·5	6·9	16·1	6·9	25·4	13·8	..	205·8
,, ..	W	58·0	26·6	21·7	38·7	14·5	14·5	16·9	21·7	24·2	7·2	..	244·3
4th Quarter..	E	20·8	11·5	18·5	23·1	23·1	13·8	18·5	16·1	25·4	16·1	2·3	189·6
,, ..	W	24·2	36·3	45·9	45·9	12·1	31·4	21·7	16·9	9·6	14·5	4·8	263·6
Whole Year..	E	32·3	20·2	17·9	10·9	10·9	9·2	14·4	12·7	21·7	13·3	2·3	165·9
,, ..	W	30·2	21·7	24·2	28·4	9·6	14·5	16·9	16·3	12·7	15·1	3·0	192·9

Average length of life in East and West Maidstone for each of the four quarters.

Deaths.		EAST MAIDSTONE.	Years.
1st Quarter....	64	Giving an average age for each individual of	33·41
2nd ,, ...	52		33·48
3rd ,, ...	89		26·28
4th ,, ...	82		36·79
Whole Year	**287**		**32·19**

Deaths.		WEST MAIDSTONE.	Years.
1st Quarter....	54	Giving an average age for each individual of	33·66
2nd ,, ...	55		38·54
3rd ,, ...101			25·19
4th ,, ...109			27·95
Whole Year	**319**		**29·88**

Average age attained at Death, during the whole year for the Borough at large = 30·97.

TABLE III.

Causes of Death, 1897, showing Rate per 1,000 per Annum for each District.

Period.	District.	Seven Zymotic Diseases.	Other Zymotics.	Phthisis.	Other Constitutional Diseases.	Diseases of the Respiratory Organs.	Diseases of the Organs of Circulation.	Other Local Diseases.	Developmental Diseases.	Deaths by Violence.	Causes ill-defined or not specified.	Total from all Causes.
First Quarter	East Maidstone ..	1·38	·46	·23	1·61	3·70	1·61	2·31	2·31	·92	·23	14·80
	West ,, ..	1·45	..	1·69	·96	2·66	1·21	3·14	1·45	·24	·24	13·06
Second ,, ...	East ,, ..	1·61	·46	·46	1·38	2·54	1·38	2·77	·92	·46	..	12.02
	West ,, ..	1·69	·24	1·69	·96	2·17	1·21	3·63	·72	·72	·24	13.30
Third ,, ...	East ,, ..	6·01	3·47	·92	1·85	·69	1·85	3·23	·92	·23	1·38	20·58
	West ,, ..	9·19	2·42	·96	·96	1·45	1·69	3·87	1·69	1·69	·48	24·43
Fourth ,, ...	East ,, ..	8·32	·23	·92	·23	1·61	1·85	2·31	2·08	·23	1·15	18·96
	West ,, ..	14·75	·24	1·45	1·21	2·66	·72	2·42	·72	1·45	·72	26·36
Whole Year.....	East ,, ..	4·33	1·15	·63	1·27	2·14	1·67	2·66	1·56	·46	·69	16·59
	West ,, ..	6·77	·72	1·45	1·03	2·23	1·21	3·26	1·15	1·03	·42	19·29

N.B.—Zymotic Diseases include Small Pox, Measles, Diphtheria, Whooping Cough, Fevers, &c. Constitutional Diseases include Gout, Cancer, Scrofula, &c. Developmental Diseases include Premature Birth, Teething, Old Age, Atrophy and Debility, &c.

TABLE IV.

Analyses of the Public Water Supplies, 1897.

Month.	Total Solids.	Loss on Ignition.	Chlorine.	Nitrogen as Nitrates.	Ammonia.		Oxygen Absorbed in		Hardness.		Appearance in 2-foot tube.
					Free. *	Alb. *	¼-hour.	4 hours.	Total.	Perm.	
WATER COMPANY.—FARLEIGH WATER.											
January 7th	27·6	2·1	1·9	·57	·00	·00	·006	·008	15·7	6·1	pale clear green.
April 3rd	35·9	2·2	2·4	·57	·02	·03	·005	·009	17·6	7·0	bluish green, sl. turb.
June 25th	33·9	3·9	2·5	·57	·01	·01	·009	·022	16·8	8·0	pale clear green.
WATER COMPANY.—BOARLEY WATER.											
January 7th	24·5	2·1	1·5	·30	·00	·00	·002	·005	13·7	5·5	pale clear green.
April 2nd	23·6	0·7	1·6	·41	·00	·00	·002	·009	14·0	4·4	clear bluish green.
June 25th	22·6	1·1	1·6	·41	·02	·01	·006	·019	13·5	4·1	clear bluish green.
WATER COMPANY.—COSSINGTON WATER.											
January 7th	23·9	1·9	1·5	·43	·00	·00	·006	·008	13·6	5·0	pale clear green.
April 2nd	22·5	0·9	1·6	·41	·01	·00	·008	·015	13·5	3·7	clear bluish green.
June 25th	23·3	3·3	1·6	·42	·00	·01	·009	·020	12·8	4·1	pale clear blue.
PUBLIC CONDUIT.											
January 7th	34·8	2·3	2·4	·57	·00	·00	·002	·006	17·5	8·7	pale clear greenish blue.
April 2nd	36·2	1·6	2·5	·57	·00	·00	·004	·014	18·5	7·3	clear bluish green.
June 25th	34·4	2·6	2·5	·57	·00	·02	·012	·020	16·5	7·2	clear greenish blue.

* In parts per million, otherwise the results are given in grains per gallon.

TABLE V.

RAINFALL IN MAIDSTONE, 1897, and excess or deficiency of Temperature.

First Quarter.				Second Quarter.				Third Quarter.				Fourth Quarter.			
Week.	Total Rain in inches.	No. of Days on which Rain fell.	Temperature.	Week.	Total Rain in inches.	No. of Days on which Rain fell.	Temperature.	Week.	Total Rain in inches.	No. of Days on which Rain fell.	Temperature.	Week.	Total Rain in inches.	No. of Days on which Rain fell.	Temperature.
1st	1·03	6	+1·4	14th	·31	3	−3·6	27th	..	..	−0·5	40th	..	..	−4·3
2nd	·23	5	−0·3	15th	·31	4	+0·9	28th	..	..	+2·6	41st	·02	1	+1 5
3rd	·08	1	−7·3	16th	·25	2	−2·0	29th	..	..	+4·0	42nd	..	..	+4·7
4th	·09	1	−6·1	17th	·23	2	+2·5	30th	·21	2	+2·3	43rd	..	..	+2·4
5th	1·65	6	−2·0	18th	·06	2	−0·6	31st	·19	1	+5·8	44th	..	..	−0·6
6th	·26	3	+2·7	19th	·06	1	−4·7	32nd	·25	1	+1·1	45th	·11	1	+4·2
7th	·04	1	+4·0	20th	·23	1	+3·3	33rd	·79	4	+0·4	46th	·17	2	+5·2
8th	·16	1	+8·2	21st	·45	4	−2 3	34th	·37	2	−1·2	47th	·87	4	+1·4
9th	1·37	6	+0·1	22nd	·53	3	+1·8	35th	·74	4	−3·0	48th	·20	1	−1·8
10th	·64	3	+0·2	23rd	·98	2	+0·3	36th	·71	2	−4·5	49th	·80	4	+1·1
11th	1·04	5	+5·1	24th	·38	2	+0·7	37th	·20	1	−3·0	50th	·78	4	+5·2
12th	·07	2	+9·7	25th	..	..	+3·2	38th	·39	2	−0·1	51st	..	..	−2·9
13th	·28	4	−2·8	26th	·44	2	+3·0	39th	·97	2	+2·0	52nd	·90	6	+6 6
Total 6·94 inches.				Total 4·23 inches.				Total 4·82 inches.				Total 3·85 inches.			
				Total for Year, 19·84 inches.											

(A) TABLE OF DEATHS during the Year 1897, in the Urban Sanitary District of Maidstone, classified according to Diseases, Ages, and Localities.

(a.)	Mortality from all causes, at subjoined Ages.							(i.)	Mortality from subjoined causes, distinguishing Deaths of Children under Five Years of Age.																				
														Fevers.																
	At all ages. (b.)	Under 1 year. (c.)	1 and under 5 (d.)	5 and under 15 (e.)	15 and under 25 (f.)	25 and under 65 (g.)	65 and upwards. (h.)		Smallpox. 1.	Scarlatina. 2.	Diphtheria. 3.	Membranous Croup. 4.	Typhus. 5.	Enteric or Typhoid. 6.	Continued. 7.	Relapsing. 8.	Puerperal. 9.	Cholera. 10.	Erysipelas. 11.	Measles. 12.	Whooping Cough. 13.	Diarrhœa and Dysentery. 14.	Rheumatic Fever. 15.	Phthisis. 16.	Bronchitis, Pneumonia, and Pleurisy. 17.	Heart Disease. 18.	19.	Injuries. 20.	All other Diseases. 21.	Total. 22.
EAST MAIDSTONE ..																													
Acres. Area 2019.—Males	141	33	17	16	10	37	28	Under 5			4			1						2	12			6	1		3	21	50
								5 upwds.			5	1		24									5	9	12		5	31	91
Females	146	23	18	15	9	45	36	Under 5			5			2						2	4			9	1			18	41
								5 upwds.			6			24							1		6	13	15			40	105
Including Deaths in West Kent Hospital as follows { M.	19	1	1	6	3	8		M			2			4									1	1			4	7	19
{ F.	15	1		2	2	7	3	F						5										4				6	15
Total	287																												
WEST MAIDSTONE ..																													
Acres. Area 1989.—Males	154	31	15	22	20	45	21	Under 5			6			1					1	2	6			7				23	46
								5 upwds.		1	6			33									13	8	7		12	28	108
Females	165	19	21	18	27	50	30	Under 5			7	2		2						2	6			7	1		1	12	40
								5 upwds.			6			43									11	13	12		4	36	125
Including deaths in Kent County Lunatic Asylum as follows ..... { M.	1				1			M															1						1
{ F.	2				1	1		F															1						2
Total	319																												
Totals	606	106	71	71	66	177	115	Under 5			22	2		6						1	8	28			29	3		4	74	177
								5 upwds.		1	23	1		124								1		35	43	46		21	135	429

The subjoined numbers have also to be taken into account in judging of the above records of mortality.

Deaths occurring outside the district among persons belonging thereto.								Under 5																					
								5 upwds.																					
Deaths occurring within the district among persons not belonging thereto.	242	1		3	15	166	57	Under 5																				1	1
								5 upwds.						10									57	18	31		5	120	241

(B) TABLE OF POPULATION, BIRTHS, AND OF NEW CASES OF INFECTIOUS SICKNESS coming to the knowledge of the Medical Officer of Health, during the year 1897, in the Urban Sanitary District of Maidstone; classified according to Diseases, Ages, and Localities.

(a.)	Population at all Ages.		Registered Births	Aged under 5 or over 5	New Cases of Sickness in each Locality, coming to the knowledge of the Medical Officer of Health.													Number of such Cases Removed from their Homes in the several Localities for Treatment in Isolation Hospital.												
									Fevers.													Fevers.								
	Census 1891. (b.)	Estimated to middle of 1897. (c.)	(d.)	(e.)	Smallpox. 1.	Scarlatina. 2.	Diphtheria 3.	Membranous Croup. 4.	Typhus. 5.	Enteric or Typhoid. 6.	Continued. 7.	Relapsing. 8.	Puerperal. 9.	Cholera. 10.	Erysipelas. 11.	12.	13.	Smallpox. 1.	Scarlatina. 2.	Diphtheria. 3.	Membranous Croup. 4.	Typhus. 5.	Enteric or Typhoid. 6.	Continued. 7.	Relapsing. 8.	Puerperal. 9.	Cholera. 10.	Erysipelas. 11.	12.	13.
EAST MAIDSTONE ..	16,548	17,293	425	Under 5		3	23			45									2	12			15						
				5 upwds.		8	74			783			4		11				4	43			264						
WEST MAIDSTONE ..	15,597	16,538	340	Under 5		3	30	3		71										15			10						
				5 upwds.		15	83			934					2				11	52			142						
Totals	32,145	33,831	765	Under 5		6	53	3		116									2	27			25						
				5 upwds.		23	157			1717			4		13				15	95			406						

APPENDIX.

To the SANITARY COMMITTEE of the MAIDSTONE URBAN DISTRICT COUNCIL.

Special Report upon proceedings in relation to a Polluted Well at 8, Orchard Street.

GENTLEMEN,

The original sample of water from the well situated No. 8, Orchard Street, was collected September 17th, 1897, and the report was rendered September 30th, at the time when the Epidemic of Typhoid was at its height, and when suspicion had fallen upon the Public Water supply as being the cause of the Epidemic. The results of the analysis (a copy of which is appended), showed the water to be polluted, though the chemical evidence indicated that the polluting organic matter was oxydized, and so far rendered inert: having regard to the proved danger from the Company's water however, there appeared less risk in using the well water than from water drawn from the public supply; therefore it appeared undesirable to cut off a source of water supply even when shown to be of suspicious quality. Consequently my advice was "it should not be used for dietetic purposes without previous boiling."

Subsequently certain members of the Council insisted upon proceedings being taken to obtain an order for the closure of the well—a course to which I was opposed.

(1.) I had reason to hope that the well might be closed by means of persuasion.

(2.) That on mere chemical grounds there might certainly be difference of opinion between professional chemists as to the interpretation to be put upon the results of the analysis.

(3.) That Local Topographical, and Medical grounds for closing the well, were in this case of far great importance than the mere chemical.

(4.) That the wording of the Act of Parliament makes it very difficult to obtain an order for the closure of a well except on analytical grounds.

To explain my meaning as to Local and Medical grounds, allow me to refer to the investigations instituted by the Local Government Board in 1881, and reported on by Sir George Buchanan, the then head of the Medical Department, to the effect that Typhoid Fever can be conveyed by the water polluted to such an infinitesimal amount that chemical analysis unaided by other considerations is misleading and powerless to safeguard the drinkers thereof, and using his own words, "unless a chemist is well-acquainted with the origin and liabilites of the water he is examining, he is not justified in speaking of a water as 'safe or wholesome' if it contains any trace whatever of organic matter; hardly indeed even if it contains absolutely none of such matter appreciable by his very delicate methods. The chemist can in brief, tell us of impurity and hazard, but not of purity and safety. For information about these we must go, with the aid of what the chemist has been able to teach us, in search of the conditions surrounding the water sources and affecting water services."

There never was a case where these maxims applied with greater force. By the plan appended it is seen

that the well producing this water is immediately surrounded on all sides by (10) houses in which (14) cases of Typhoid have recently occurred. The urine and evacuations from the bowels of 11 of these cases have been discharged into imperfectly flushed drains; from my knowledge concerning the condition of the house drainage generally,—I cannot doubt but that there has been pollution of the soil by Typhoid matter in the neigbourhood of this well, which now or at some future time may reach the water in the well and so produce a fresh outbreak of Typhoid, consequently the water is dangerous to those who drink it.

I would further quote from a letter from the Local Government Board dated September 4th, 1883; the following passages which refer to wells polluted in a similar way to the Orchard Street case.

"The Board direct me to state that having regard regard to the fact that the wells in question derive their supply from a soil that is much befouled by cesspools in near proximity to them, they are of opinion that measures should at once be taken by the Sanitary Authority to secure their closure."

"I am however, to point out that quite apart from the positive evidence as to pollution which chemical analysis has in this case afforded, the Board in forming an opinion as to the wholsomeness or not of a water, have regard to a full knowledge of its sources and of the local conditions by which it is liable to be affected than to its mere chemical ingredients. In this connection I am to direct the attention of the Sanitary Authority to pages XVII. to XXI. of the accompanying print, &c., with special reference to the opinion

expressed on page XXI., "that we must go beyond the laboratory for evidence of drinking water being free from dangerous organic pollution."

So much in explanation of the reasons and grounds of my action. At the first hearing of the case (January 25th) it was adjourned for the defendant's chemist to attend; and at the second hearing (February 25th) Mr. Gregory and Mr. Wanklyn on behalf of the defendant declared the water on chemical grounds to be wholesome. A further adjournment took place, and an order was made for a sample to be sent to the Inland Revenue Laboratory at Somerset House; this having been done the third hearing took place on March 15th, when three separate analyses upon samples collected at different times from the same source were before the Bench. In the main the three analyses agree, so that there is *no dispute as to chemical facts;* such differences as do appear indicate a progressive pollution of the water—the thing that is most to be dreaded.

The full text of the Somerset House Certificate is appended, and for your convenience I also append a form showing the results of the three analyses reduced to the same terms so as to make them comparable.

In passing, I would have you remark that the Somerset House Certificate is signed by Mr. Bannister and Mr. Lewin, but not by Dr. Thorpe, the Principal of the Government Laboratory. To the best of my belief these gentlemen have not 500th part of the experience I have in water analysis, and have no local knowledge whatever to assist them in the interpretation of one of the most difficult problems in applied chemistry, fraught with the most momentous issues that

can be imagined, and this is what they say in the last paragraph of their report.

"From a consideration of all the results of the analysis there are grounds for stating that the water is not liable to contamination from the immediate neighbourhood of the well, and although the water on account of its hardness could not be recommended for general domestic purposes, we are of opinion that its use for potable purposes is not likely to prove injurious or dangerous to health."

Now it is my duty to tell the Committee that it was a mistake for the Justices to send the water to Somerset House; that the Somerset House chemists have no kind of authority whatever in respect of disputes in water analysis; nor have they the smallest claim that would fit them to express an opinion bearing upon an analysis of a Maidstone water, and with a full sense of my responsibility, it is my bounden duty to tell the Committee that the gentlemen who signed the Somerset House Certificate have acted in a reckless manner, going outside the province of the chemist, and intruding upon the functions of your sanitary officers in stating that the water in question "is not liable to contamination from the immediate neighbourhood of the well" and that it "is not likely to prove injurious or dangerous to health," thereby exhibiting ignorance of established facts concerning the pollution of water and its consequences. And forasmuch as this action on their part will have made it impossible for the Urban District Council to exercise that control over the water supply of the Borough, which it is necessary they should have and should exercise, it is my advice that the matter should on no

account be allowed to rest without an effort being made to remove the mischief caused by their interference.

I would suggest that an application be made to the Local Government Board to cause an Investigation into all the facts.

I have the honour to be,
Yours obediently,
MATTHEW A. ADAMS,
Medical Officer of Health.

March 25th, 1898.

GOVERNMENT LABORATORY,
SOMERSET HOUSE,
LONDON, W.C.

The sample of water referred to in your letter of the 16th ult., and stated on label to have been obtained from "Orchard Street" on 16th February, 1898, was received here on the following day securely sealed. The water was found to be colourless, clear, and odourless. We hereby certify that we have analysed the water, and declare the results of our analysis to be as follows:—

Albuminoid Ammonia	=·0064	Parts per 100,000.
Free Ammonia	=·001	
Oxygen consumed	=·009	
Total Solids (dried at 212 F.)	=54·1	Grains per gallon.
Chlorides (stated as Sodium Chloride)	=4·45	
Nitrates (stated as Nitrogen)	=1·81	
Nitrites	trace.	
Total hardness	=34·0	Degrees.
Permanent hardness	=20·0	

Judging from the figures shown under the terms "Albuminoid Ammonia" and "Oxygen consumed," the water is regarded as of fair quality, and the results in these respects compare favourably with those obtained from samples of water drawn from the mains of the London Water Companies during the month of December. The proportion of Nitrates is rather high, but having regard to the character of the mineral constituents of the sample it does not indicate that the water is exposed to organic contamination.

The amount of Chlorides for so hard a water is not regarded as excessive. From a consideration of all the results of the analysis there are grounds for stating that the water is not liable to contamination from the immediate neighbourhood of the Well, and although the water on account of its hardness could not be recommended for

general domestic purposes, we are of opinion that its use for potable purposes is not likely to prove injurious or dangerous to health.

As witness our hands this eleventh day of March, 1898.

Signed, R. BANNISTER.
G. LEWIN.

Clerk to the Magistrates,
Maidstone.

WATER ANALYSIS—REPORT.

	Local Standard for Ragstone Water, Conduit Supply	Adams, 17th Sept., 1897.	Gregory, 2nd Dec., 1897.	Somerset House, 16th Feb., 1867.
Total Solids	32·89	53·6	52·0	54·1
Loss on Ignition	2·51	2·0	?	?
Chlorine	2·30	3·4	3·01	2·7
Nitrogen as Nitrates	·466	1·14	1·840	1·81
Free Ammonia	·005	·00	·02	·10
Albuminoid Ammonia	·015	·05	·03	·064
Oxygen absorbed in ¼ hour	·008	·013		
,, ,, ,, 4 hours	·018	·018	·0096	·0063
Hardness, Total	17·4	23·1	33·6	34·0
,, Perm.	6·5	15·6		20·0
Appearance in 2-ft. Tube	cl. p. blue	gr. bl., rather dty		cl., colourless
Smell	none	none		none
Phosphoric Acid	trace	sl. trace		?
Nitrites				trace

All results given in grains per gallon, except free and Albuminoid Ammonia, which are in parts per million.

W. S. VIVISH, GENERAL PRINTER, KING STREET, MAIDSTONE.

DIAGRAM OF THE SURROUNDINGS OF THE ORCHARD STREET WELL.

BRUNSWICK STREET

29 (3 CASES)

28 (2 CASES)

27

(1 CASE)

1 CASE

1 CASE

1 CASE

26

66

60

52

ORCHARD STREET

GEORGE STREET

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

THE WELL

24 (1 CASE)

(1 CASE)

20

ORCHARD HOUSE

ORCHARD COTTAGE

(1 CASE)

CORRALL'S ALMSHOUSES

HOUSES IN WHICH ENTERIC FEVER OCCURRED.

HOUSES SUPPLIED BY "THE WELL"